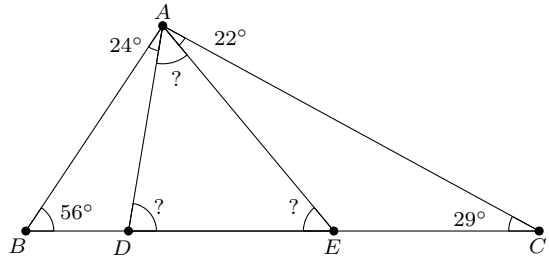
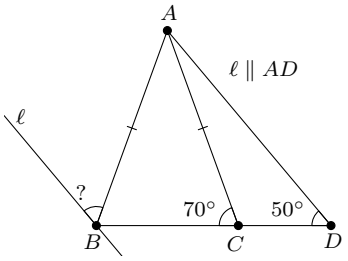
Angles and Triangles

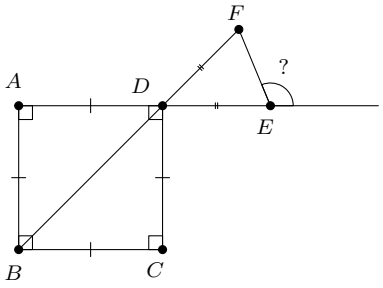
Grade 5-6 Olympic Math

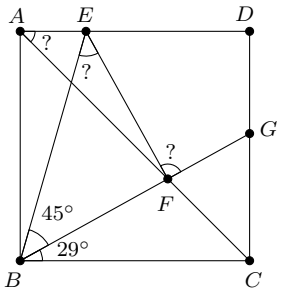
January 9, 2016

1. In the following figures, find the angles denoted by the question marks.









ABCD square

2. What is the maximum number of acute interior angles a triangle can have? Right angles? Obtuse angles?

3. (a) What is the sum of the interior angles of a quadrilateral?

   (b) What is the sum of the interior angles of an n-gon (a polygon with n sides)?

4. Let ABC be a triangle and suppose that there is a point D on BC such that $AD = BD = CD$. Show that $\angle BAC = 90°$.

5. Let ABC be a right angle triangle with hypotenuse BC, and let D be the midpoint of BC. Show that $AD = BD = CD$.

   (*Hint:* Let D' be the point on BC such that $AD' = BD'$. Show that $AD' = CD'$ by angle chasing.)